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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

JULY 18, 1936

Cosmic Ray Path

See Page 45

A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

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The Weekly Summary of

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Edited by WATSON DAVIS

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DO YOU KNOW?

Chinese alchemists devised formulas for producing a pill of immortality.

The new Railway Museum in Tokyo has on exhibit the first locomotive that drew the first train in Japan.

A clay produced in Wyoming has proved to be one of the best spreaders for the insoluble copper sprays that are used as insecticides.

A new laboratory and greenhouses at Pennsylvania State College will be used in studying ways of improving pasture lands of northeastern states.

Snapshots on cloth are being attempted in Russia, using silk and canvas soaked in special emulsion instead of the usual photographic paper.

Parents of school children in New York State have rated elementary school subjects in the following order, so far as their value is concerned: arithmetic, spelling, English, reading, writing, health, physical education, music, art, sciences, safety, fire prevention, manual training, geography, household arts, history, social studies, civics.

One historian estimates that there were probably 150,000 Spaniards in the New World in 1574.

Improper tire inflation affects not only the wear of a tire but also the fuel consumption of the vehicle.

Solomon, says one archaeologist, was one of the first great copper kings, and copper was his main export in trade.

Tons of ammunition, some of it unexploded, are still being recovered from French ground where World War battles were fought.

The world's speeding up of armament construction is causing great demand for such metals as tungsten and cobalt, used in toughening steel.

An expedition digging in southern Palestine has found papyrus documents of 566 A.D., and pronounces them the first papyri found in Palestine.

Because some gardeners dislike the yellowish residue left on leaves after they are dusted with sulfur, a sulfur dust dyed green has been produced.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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ECLIPSE!

June 19, 1936

PREPARED

Miss Henriette Swope, member of the Harvard expedition and daughter of Gerard Swope, "stands by" at her instrument.

The photographs on this page were taken by the special news photographer of Sovfoto at Ak-Bulak, U.S.S.R., where the Harvard expedition and that from Pulkovo Observatory, Leningrad, were located.

ENCAMPED

In these quarters the Harvard expedition made ready for the big event. Preparations for a meal are going on at the moment toward the left of the picture.

SETTING UP

Dr. Wallace R. Brode, of Ohio State University, at work on the instruments.

TOTALITY

Silent, tense figures watch a Siberian sun hide its face from view. The picture at left shows the moment of totality.

EXPLAINING

A scientist does his best to prepare the farmer folk of the neighborhood for the awesome spectacle.

WILDLIFE MANAGEMENT

Drought Menaces Wildlife In Western National Parks

Situation Most Acute in Wind Cave National Park Where Animals Lack Pasturage and Hay for Winter

DROUGHT has developed a new menacing front in the Northwest—big game animals in the U. S. National Parks, now on parched pasturage, are threatened with starvation next winter through shortage of the hay crop that has ordinarily supplied supplementary feed.

The situation is most acute at present in Wind Cave National Park, a small park on the south slope of the Black Hills in South Dakota. Although the total number of bison, elk, antelope, and deer on this comes to less than 500 head, lack of pasturage now and hay for next winter makes even this small number look like too much of a load.

In Rocky Mountain National Park there has long been a deer-and-elk problem, because the natural range north of Estes Park is overstocked, and efforts of the National Park Service to get it extended have thus far been unsuccessful. Glacier National Park, on the other hand, offers less of a problem, because the deer pasture there depends primarily on winter snows, and these have been abundant even when the Plains have suffered from both summer and winter drought.

Problem at Yellowstone

Yellowstone National Park of course has the biggest problems to face, because it supports the largest herds of big game, and because droughts of the past few years have left the range in bad shape. The present state of the range where the thousand buffalo feed is not accurately known at the moment, but a survey has been started.

The 10,000 head of elk which constitute the so-called Northern and Gallatin herds are known to be a grave overload on their natural range, but efforts to get more land have been stymied by the opposition of ranchers whose lands run right up to the northern boundary of the Park. The Southern elk herd feeds in Yellowstone Park only during the summer, and lives most of the time outside the Park boundaries, so that while it presents a serious problem, the responsibility for solving it does not rest primarily on the National Park Service.

Distress and possible wholesale starvation of the Yellowstone elk herds, the largest surviving groups of these animals left in the United States, will undoubtedly be intensified by the difficulty of procuring supplementary feed. In past "distress winters," public-spirited citizens have often dug down into their own pockets to purchase hay from outside resources, but this year they will have to bid against the urgent need for feed of all kinds to save the herds of domestic animals throughout the drought-swept Northwest.

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CLIMATOLOGY

New Dust Bowl Forming In Drought-Stricken Area

DROUGHT is making another dust-bowl in the Northwest, to replace the one in the Southwest that was blotted out, at least temporarily, by heavy rains a few weeks ago. The soil of the Dakotas and Montana, left naked over wide areas by the death of all vegetation, lies loose to any wind that chooses to blow.

For the present, dust storms are not expected, for strong winds are rather exceptional in summer. But when the powerfully stormy northwesterlies begin to blow, in late autumn and winter, it will be another story.

"Unless the land can be well covered with vegetation, there is every likelihood that the drought area will furnish severe dust storms," Dr. Walter C. Lowdermilk, of the Soil Conservation Service, U. S. Department of Agriculture, told Science Service. And at present the prospects for covering the land appear very slim indeed.

A snow cover, falling early and persisting through the winter, might avert the wrath to come until March, when the snow melts off and the high winds will blow the dust regardless. But if the winter is open and relatively snowless, as it often is in the Northwest, the dust storms may rage all winter through.

In the new dust bowl as in the old, there is only one dependable permanent remedy: cut down the plowed area and increase the acreage of deep-rooted, long-lived grasses.

Science News Letter, July 18, 1936

GEOGRAPHY

Drought, Dust and Pests, But Anyway No Prairie Fire

IN ALL the long catalog of woes that heat and drought have brought to the West, at least one former affliction has been spared—the prairie fire.

Chronicles of pioneers of the Prairies and Plains tell again and again of this deadly sweeping terror, that would spring over the horizon without any warning, rage through the cotton-dry grass and down upon the unwary caravan faster than any Cossack charge.

Its causes were various: occasionally a bolt of lightning, with insufficient rain afterwards to extinguish; sometimes a careless campfire set by some other traveler; more often the Indians, who would purposely start the fire either to clear the way for fresh young grass for the buffalo, or as a deliberate weapon against the invading whites.

There was one effective weapon, if you saw the prairie fire's approach soon enough, and the wind was not too high. You could "backfire"—in desperate haste pluck out a circle of grasses a few yards in diameter, start a fire at the edge of it, and stand with a blanket wrapped round your head while the brief flames flared round you. Then retreat into the blackened area of safety you had created, or even stay right where you were, if perchance the momentary wind had carried your ally-fire toward the approaching bigger enemy. Lonely settlers often saved their houses and barns by first plowing a few furrows around them, and then starting the back-fire.

No Fuel

But now there are no prairie fires, because there is no fuel for them. "The plow that broke the Plains" broke also this one enemy of the plainsmen. Cultivation abolished much of the old-time deep grasses that stood dry and inviting fire in times of drought, and what the plow did not do the too-many hungry cattle did.

White man's appetite for grain, whetted by year upon year of failure to get it, loaded the remaining rangelands with far more hungry animal mouths than

they could support on a continuous-yield basis in times of full rain. And during the present dry half of the irregularly recurring climatic cycle, those mouths, desperate with starvation, have skinned the grass down to the very roots. There is nothing left to eat, nothing left to burn.

Perhaps there are plainsmen who still remember old times with something of a pang—who would not be wholly sorry to see an old-fashioned prairie fire again, because if it did symbolize destruction, it also symbolized a high abundance even as did the "whole burnt offerings" of ancient Israel.

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PHYSIOLOGY

Electrical Changes in Body Controlling Factor in Growth

By PROF. H. S. BURR, Yale University School of Medicine

IN ALL probability, wherever there is life, electrical phenomena are to be found. Electrical studies of living plants and animals have added much to our information since Galvani first published his description of "Animal Electricity."

Great progress has been made in the study of the nervous system through the adaptation of recent commercial radio apparatus to this use. However, it has been very difficult to determine with precision the nature of the electrical currents which have been noted in association with living animals and plants since most of the meters used require current for their operation, and hence have complicated the results by the effects of changes in resistance.

To overcome these difficulties, a vacuum tube microvoltmeter has been developed which is stable, draws no current and is, therefore, independent of resistance. With this instrument, differences as small as a millionth of a volt can be read accurately. Reproducible voltage differences of a characteristic order in fishes, salamanders, frogs, chicks, rats and mice, cats, rabbits, dogs, monkeys and man have been obtained.

Accompanying Life Processes

Moreover, it has been shown that these voltage differences are very closely associated with minute variations in the living process. The instant of ovulation in the intact cat and rabbit and an electrical rhythm in the menstrual cycle in women has been recorded. A marked change associated with the appearance of cancer and a definite correlation with growth during the embryonic and adult life have been observed.

In a rather surprising way it has been found that the voltages developed are not the result of chaotic currents but of currents organized into a very definite pattern which is characteristic of the species and may show the same individual differences as do series of finger prints. With this instrument, it is possible to write a kind of electrical formula for the individual animal.

"Prospect" the Body

In addition, it is possible to study electrically a live animal with very great accuracy without having to kill it for analysis or without in any real sense modifying its activities. In fact, it is possible to prospect the body of an animal for voltage differences much as a geophysicist maps the surface of the ground for hidden ore. Plots constructed in this way give numerous clues to what is going on inside the animal.

It has been found, moreover, that readings taken from any two points on the body reflect not only what is going on in the immediate vicinity of those points but also the *total* activity of the animal. Every animal so far studied produces electricity in amounts that can be accurately measured.

The data suggest that each animal possesses a dynamic electrical picture which, although constantly changing in minor ways, nevertheless, possesses recognizable individual characteristics.

There is a very real possibility that this electrical picture or electrodynamic field may provide the explanation of the amazing capacity of an animal to grow from a single egg into a multiple-celled adult in the midst of the rapidly changing chemistry of development.

Hope For New Clue

It may be that in these electrical studies will be found the clue to the mechanisms by means of which the chromosomes determine such things as shape of face and color of eyes, and that "animal electricity" is the expression of a fundamental electrical field acting as a guiding and controlling factor in the development of any individual.

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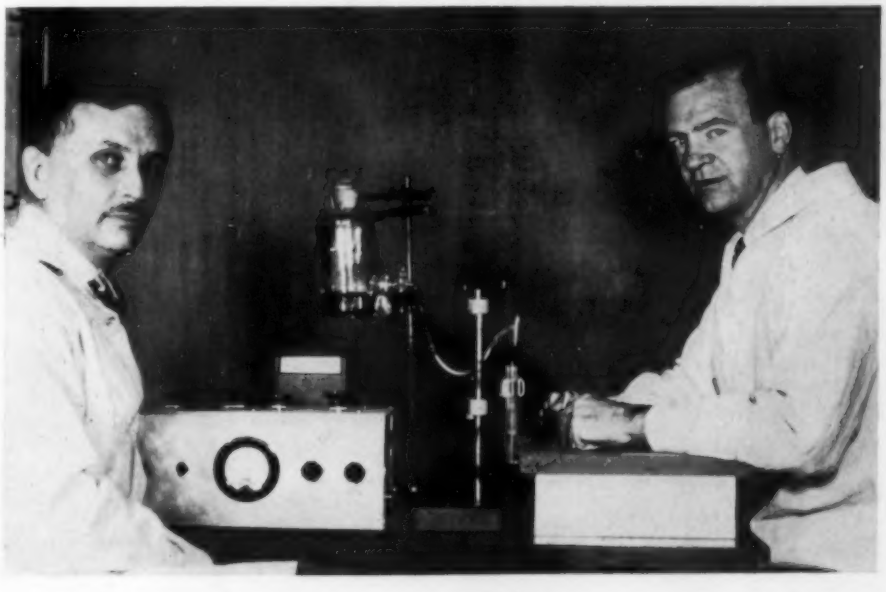

STUDY BODY CURRENTS

How Yale experimenters study electricity of nervous system by adapting radio apparatus to this purpose. Prof. H. S. Burr, left, is ready to make measurements upon Dr. R. G. Meader, right, who has his fingers in salt dishes to make electrical contact between his body and the sensitive instruments. Taking of readings is accomplished simply and without discomfort to the person being tested.

PHYSIOLOGY

Transplanted Glands Make Giants in Later Generations

SEXUAL precocity and startlingly speeded-up growth is visited upon the great-grandchildren of rats if the four generations involved have implanted into them a succession of thymus glands.

Two years ago Dr. Leonard G. Rowntree of the Philadelphia Institute of Medical Research excited the medical world by announcing his discovery that injections of extract from the thymus gland, then one of the most mysterious parts of the body, in successive rat generations produced rat giants of increasing magnitude. A seventh generation thymus-treated rat seven days old was three times the weight of a normal one eight days old, and it was otherwise old before its time. (*See SNL*, April 7, 1934, May 12, 1934, Oct. 13, 1934, Dec. 15, 1934.)

Now Dr. Rowntree, with an associate, Dr. N. H. Einhorn, has made a similar experiment, using weekly implants of whole thymus glands from other rats, instead of the injections of gland extract. The glands produced an acceleration of growth rate and development, although the effect was not quite so large as when daily injections of extract were used. The new experiments are reported in *Science* (July 3), and the scientists consider them important confirmation of their previously reported evidence as to the biological effect of thymus extract.

Translated from rats to human terms, thymus treatment means that girls or boys might become sexually mature at the age of 8 or 10 years, if they, their parents, grandparents and great-grandparents had been thymus treated.

The thymus gland is closest to the heart of any endocrine or hormone-producing organ. All animals from primitive fishes up to and including man have thymus glands. Sweetbreads of the dinner table are the thymus glands of calves and it was from them that Dr. Adolph M. Hanson, physician of Faribault, Minn., obtained the extract used by Dr. Rowntree in his early experiments.

Before the Rowntree experiments, the thymus interested physicians because it sometimes chokes little babies to death. It is a pinkish mass, one ounce in weight, in the upper chest of children, which dwindles to seeming insignificance at sexual maturity.

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CHEMISTRY

Wool From Italian Milk Failure in German Test

SYNTHETIC wool made in Italy from casein, the cheese protein, has failed under German laboratory tests for strength and elasticity, reported by Dr. K. Graefe. (*Zeitschrift für angewandte Chemie*).

Single fibers of the widely hailed Italian artificial wool were compared with fibers of natural merino wool. When dry, natural wool fibers could carry a load of 7.5 grams before breaking, while fibers of the "cheese wool" broke under a load of only 3.7 grams. There was an even greater discrepancy in the strength of the two kinds of fibers when wet. Then the natural wool required a load of 5.2 grams to break it, and the synthetic fibers only 1.7 grams.

"Cheese wool" fibers made an especially poor showing under the stretch test. They could be stretched to only 9.3 per cent more than their original length before they broke, whereas natural wool fibers would stretch 39 per cent when dry, and 55 per cent when wet. They also failed signally under the bending test: a "cheese wool" fiber could be broken by 80 bendings back and forth, whereas a natural wool fiber withstands from 500 to 1000 bendings.

Dr. Graefe thinks that the failure of casein wool may be traced to the shape of its individual molecules. The molecules of all good fibers—whether natural like cotton and silk, or artificial like rayon—are long and slender; miniature fibers themselves. The molecules of casein are short and lumpy, and simply do not pull together.

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ASTRONOMY

Nova Cephei With Second Outburst Has Speed Record

WITH a new and second outer shell expanding and rushing outward at the record rate of 2,100 miles per second, the "new" star or nova now visible in the sky is unusually interesting to astronomers at the Carnegie Institution's Mt. Wilson Observatory.

A gigantic outrush of gases in the form of a shell is usual with such novae, but two days after its discovery on June 18, Nova Cephei (or Nova Lacertae as it is also called, since it is on the border of the two stellar constellations) developed a second outburst which achieved the largest velocity thus far measured in any nova.

Now dimmer than it was at the peak of its outburst, the star at its best is estimated to have been 100,000 times as luminous as the sun. Its distance from earth is estimated at 2800 light years.

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AGRICULTURE

Winter Wheat Harvest Won Race With Drought

A DRAMATIC race for the nation's bread was won in the great central grain belt, as farmers harvested their winter wheat while the drought grew worse day by day.

The devastated wheatfields of the Northwest represent the bulk of the nation's spring-wheat crop. Because it is planted in the same season that it is harvested, it got a late start and had relatively little use of the snow-water left in the soil. Winter wheat, grown predominantly in regions farther south and east, was well covered with snow last winter, used the thaw-water in spring to complete its growth, and came on through to harvest in good shape.

The wheat harvest of the Pacific Northwest—Oregon and Washington—has given no concern, except locally on light soils. Throughout most of this important cereal-growing area, the condition of the crop is reported as "good to excellent."

Small-grain crops other than wheat,

being mostly spring-sown, have suffered like the spring wheat. Oats, next in importance to wheat among small grains, is a short crop over practically the entire grain belt.

A note of tragic irony was injected into the drought situation, by losses sustained by the Arkansas rice crop. This water-needing grain suffered not from drought, but from too much water, that burst the dikes around the fields and ruined many acres.

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PHYSIOLOGY

Certain Cells of Body Not Only Eat But Also Drink

This Bibulous Type Has Outer Edge Which Flattens To Resemble a Ruffle and Traps Liquid in Its Folds

MOVING pictures of life under the microscope show that certain cells of the body drink as well as eat, using a ruffle for their drinking.

This discovery was made by Dr. Warren H. Lewis, of the department of embryology of the Carnegie Institution of Washington and the Johns Hopkins Medical School. For this bibulous type of cell activity he has used the Greek word, pinocytosis, meaning "drinking by cells." Since seeing it in studying moving pictures of cell life Dr. Lewis has been able to observe it directly by watching the cells through the microscope without the aid of the camera.

The outer edge of these drinking cells flattens out into a thin membrane which looks like a ruffle. In the films it is seen to be constantly waving about, often projecting out for some distance from the body of the cell. Globules of fluid in the medium in which the cells live can be seen floating into a fold of the ruffled edge of the cell and being surrounded by part of the ruffle. Trapped within its folds, which probably fuse around the globules and completely enclose them, they move rapidly on into the interior of the cell and within from one to five minutes may be seen with other globules that surround the cell nucleus. Once within the cell they are apparently digested by digestive fluids produced by part of the cell.

Some of these cells are pretty heavy drinkers, it appears, for Dr. Lewis reports that under certain conditions they take in a relatively enormous amount of fluid. In the course of an hour the total may amount to one-third of the volume of the cell. As though a human toper were to down six or eight gallons in the same length of time. It is not only the macrophages which are drinking cells. Dr. Lewis has seen cancer cells drinking and also has observed the phenomenon in cells from part of the stomach tissue of rats. It may be that all cells drink.

This cell drinking indicates a new way in which cells can get nourishment and a new mechanism for filtration or purification of body fluids. It also seems to confirm the theory that these macrophage cells are the chief battle sites in the body's war against disease germs.

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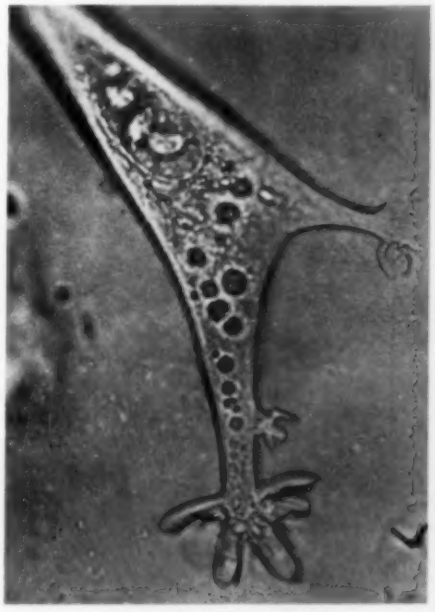

IT DRINKS

This sarcoma cell, highly magnified, is drinking through the semi-circular ruffle at its bottom edge. Note the small, dark globules of fluid that the cell has already drunk, on their way up to the center of the cell where they will be digested.

CHEMISTRY-PHARMACY

Sun Preserves Drug Better Than Chemical

SUNLIGHT is a better and more permanent preservative of a commonly used tonic, syrup of ferrous iodide, than the chemicals ordinarily employed to keep the medicine, it appears from the report of Prof. H. V. Arny and his associate, Dr. W. C. Mende of Columbia University to the American Association for the Advancement of Science.

Syrup of ferrous iodide when freshly prepared is "of an attractive green color," but when allowed to stand in a dark place or in diffused light for a few weeks it turns brown. This is due to liberation of free iodine.

"Such darkened syrup of ferrous iodide is dangerously irritating when taken internally and must not be dispensed by the pharmacist in such shape," it was pointed out.

Sun Restored Color

"Old time apothecaries found that the brown syrup returned to its original green color by the simple expedient of exposing it for a few hours to direct sunlight."

Since 1876 chemical preservatives have been added to the syrup but with little effect. The best of them kept the syrup green for only six months. Turning back to the notion of the old-time apothecaries, Dr. Arny again tried the effect of sunlight. He found that by keeping the syrup alternately in the sun and in the dark, making about five or six exposures to sunlight, he finally obtained a syrup of ferrous iodide which had a permanent green color.

The sunlight brings about this effect by converting the ordinary cane sugar of the syrup to "invert" sugar, a mixture of dextrose and levulose. When the inversion is completed by sufficiently long exposure to sunlight, the quantity of levulose present is sufficient to preserve the ferrous iodide permanently.

Boiling Also Effective

Immersion of the brown syrup in boiling water for an hour is as effective as sunlight in bleaching the color. Their research, Drs. Arny and Mende suggest, indicates the possibility of manufacturing definitely permanent syrup of ferrous iodide. It also shows that physicists investigating the influence of light on chemicals may do as much in this field for medicine as they have for photography.

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PLANT PHYSIOLOGY

Blue Light Causes Plants To Bend Toward Each Other

DIFFERENT colors of light not only produce different rates of growth in plants, but in some way cause neighboring seedling-tips to seek or shun each other, Dr. Enoch Karrer of the Smithsonian Institution has discovered.

Dr. Karrer grew large numbers of oat seedlings, and exposed sets of them to the rainbow-band of light obtained by splitting up the white light of an electric arc. Seedlings exposed to blue light showed the expected reaction of bending toward the light. But they also showed an unexpected reaction: they also bent toward each other. Red light produced an opposite "social" effect: red-illuminated oat seedling-tips bent away from each other.

Plants receiving orange light became greener than their neighbors, while those receiving only blue-green light developed the most marked yellowish color. Roots grew longest in the extreme blue and shortest in the orange-red.

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ENTOMOLOGY

Grasshopper Damage Grows As Hungry Insects Migrate

GRASSHOPPERS are migrating, reports Dr. P. N. Annand of the U. S. Department of Agriculture, recently returned from an inspection tour of the field of the 'hopper war. They have spread over areas of Oklahoma not previously infested, and have also moved into Arkansas. In Oklahoma alone, within a few days they destroyed about fifty thousand acres of corn and an equal area of cotton.

In Kansas, they have been held in check somewhat, because county funds have been available to purchase poison-bran bait. State funds, lacking in Kansas, have enabled Iowa to meet the invasion at a line across the western third of the state, beyond which the insects are not causing major harm as yet, though present in considerable numbers. In Nebraska, with no funds of any kind and plenty of 'hoppers, the situation is very bad.

Minnesota fought the plague vigorously for several years past, so that this year that state has relatively few of them. In the Dakotas they are not as bad as they were in 1935 and 1934, but in this drought-smitten area the crops are so little worth saving that not much effort is being made against the grasshoppers.

Federal funds, made available in the closing hours of Congress, have now been spent for poison-bran bait materials, which are being distributed as far as they will go.

Much of the mischief to corn has been due to the cutting of the small grains, which caused a mass migration to the cornfields, where the insects are feeding now. They will probably do immense damage to the corn crop throughout the Missouri valley if the drought and heat continue.

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PUBLIC HEALTH

Camps Comparatively Safe In Meningitis Epidemic

LIFE in CCC camps proved much safer than life in the surrounding communities when an epidemic of meningococcic meningitis occurred in Missouri and Kansas last summer.

Now it can be told to doctors and the public, and Capt. Dwight M. Kuhns of the Army Medical Corps, Fort Leavenworth, Kans., reports on the control measures adopted in three CCC camps when the disease broke out. (*Journal, American Medical Association,* July 4).

The CCC boys, in addition to the usual quarantine, daily medical examinations and inspection and sterilization of food and dishes, were treated early with antimeningococcus serum. Only one man died, a mortality rate of 11 per cent. Outside the CCC camp, 83 per cent of the patients died.

Aside from the serum used, the most effective control measure at the camps was to do away with all crowding. A space of three feet between cots was required, and head to foot sleeping was initiated.

In the end 395 persons were given meningococcus filtrate to determine its value as a skin testing and immunizing substance. None in the intervening ten months has developed meningitis, although at Tarkio, Mo., scene of the first outbreak, four cases developed among those not immunized.

In presenting this preliminary report, Capt. Kuhns states that in order to prove the value of the meningococcus filtrate as a skin testing and immunizing agent it should be used in a large number of epidemics over a long period of time.

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IN SCIE

PHYSIOLOGY

Tuna Fish, Dust, Ragweed Cause Hives and Hay Fever

TUNA fish, house dust, chicken feathers, and ragweed pollen lead the list of substances which give trouble to persons suffering from an allergy such as hay fever, hives, asthma, or migraine, it appears from a report by A. A. Janson of the North Shore Clinical Laboratory, Evanston, Ill., to the *Illinois Medical Journal.* He reviewed 300 consecutive cases in which tests were made to find the particular protein for which the allergy patient had an idiosyncrasy.

Foods, he found in these cases, more frequently caused trouble than any other group. More persons were sensitive to fowl than to other meats, and chicken and turkey were the worst offenders. Spinach ranked rather high, 60 patients, mostly children, being sensitive to this vegetable. Eggs, frequently suspected of causing allergic reactions, were guilty only 24 times in this series of cases.

Ragweed was the worst offender among the pollens, with sunflowers a close second. Chicken feathers led the list in the group which included feathers, horse hair, and cat hair. In a miscellaneous group, house dust, orris root (found in many face powders), and silk were the most frequent offenders.

Science News Letter, July 18, 1936

PHYSIOLOGY

New Sex Hormone Obtained In Crystalline Form

A NEW sex hormone, different in both chemical composition and physiological effects from the ones already known, has been obtained in crystalline form from the female sex glands of slaughtered animals by Robert H. Andrew and Frederick Fenger of Armour and Company's research laboratory in organotherapeutics. The discoverers have reported briefly to *Science* (July 3), and announce their intention to publish their results at greater length soon.

Science News Letter, July 18, 1936

EE FIELDS

GEOGRAPHY

Canada's Northwest Never Had a "Lost World"

THE LEGEND of a tropical "lost world" in northwestern Canada, a region in which it was supposed that tropical vegetation and prehistoric animals existed in frigid surroundings, was exploded in the Maiben lecture address at the recent A.A.A.S. meeting, by Dr. Charles Camsell, Canada's deputy minister of mines.

Dr. Camsell last August led an airplane expedition that covered 4,000 miles. He tried without success to find the so-called "tropical valley" of northwestern Canada. Although the legend had persisted for many years, it was found to be pure fiction.

There are, however, unexplored areas still awaiting the adventurous geographer and scientist. The Mackenzie mountains, greatest single mountain group in the whole of Canada, are to a large extent unexplored and their structure and history are unknown. Dr. Camsell has pronounced them the most difficultly accessible region in the whole Dominion of Canada and he predicted that they will probably be one of the last portions of this continent to be accurately mapped.

The Mackenzie mountains commence at latitude 60 degrees, immediately west of Liard river, and extend northward and then northwestward for about 600 miles as a gradually broadening belt of mountains about 300 miles wide.

Science News Letter, July 18, 1936

PHYSIOLOGY

Fright Speeds Heart But Form of Beat Unchanged

IF THE chair in which you are sitting should suddenly and unexpectedly tilt backward, or if an auto horn concealed beneath it is abruptly sounded, your heart would begin to beat faster, but the form of each beat will remain virtually unchanged.

Experiments of this kind, designed to determine the effect of fright on heart action, were made by Dr. N. N. Springer of New York University.

The subjects of the tests, who were given no hint of what was to happen, were college students. The instrument used to study the heart action is the electro-cardiograph, which makes use of the fact that each time the heart beats it generates an exceedingly tiny electric current, of the order of a millionth of that passing through an electric light bulb. The variations of heart current are photographically recorded in the form of a wavy line and it is possible, by examining this curve, to detect and diagnose many heart ailments not revealed by ordinary examination.

Muscular contractions of other parts of the body, however, such as the involuntary clenching of the fists accompanying sudden fright, will generate similar currents which mask those due to the heart itself. Consequently, in Dr. Springer's experiment, the muscle currents had to be compensated by an extra set of wires attached to the limbs.

The final records showed that the heart rate increased in some cases as much as 40 or more beats per minute within the space of 3 or 4 beats following the scare and gradually returned to the normal rate in about ten seconds, but the actual form of the wave remained unaltered.

Science News Letter, July 18, 1936

BOTANY

Oregon State Flower 30,000,000 Years Old

OREGON'S state flower, the "Oregon Grape" is a real native bloom, its ancestors having lived in this region more than 30,000,000 years ago.

Fossil leaves have been identified by Dr. C. A. Arnold, University of Michigan paleobotantist, in miocene rocks from eastern Oregon. The Oregon grape is not really a grape, but belongs to the barberry family.

Cigarbox wood also grew in this same region ages before smokers arrived. The rock records show that "Mexican cedar" thrived there, whereas it is now native only to the tropics and eastern Asia. Again, incidentally, this "cedar" is a species of mahogany.

Apparently the eastern Oregon of miocene times was inhabited by many plants no longer native there, Dr. Arnold states. From fossil leaves, seeds and fruits he has identified the gingko tree and ailanthus, or Tree of Heaven, now native only to Asia, and the ironwood, found now only much farther east.

Science News Letter, July 18, 1936

PLANT PHYSIOLOGY

Alga Found to Thrive Planted in "Heavy Water"

HEAVY water—formed of double-weight hydrogen atoms with oxygen—is not necessarily poisonous to plant life, experiments have indicated, Dr. Herbert Meyer of the Plant Physiology Institute of the German University in Prague, Czechoslovakia, states. (*Die Naturwissenschaften,* May 29.)

Dr. Meyer used cultures of the lowly one-celled alga, or water-plant, known as *Chlorella vulgaris.* This is a favorite experimental organism, because it is so easily handled in the laboratory. Planted in high concentrations of heavy water containing the necessary mineral elements, the alga grew quite as well as did control cultures planted in parallel setups containing ordinary water.

Science News Letter, July 18, 1936

PLANT PATHOLOGY

"Gas Attack" Repels Fungus On Tobacco Plants

DOWNY mildew or blue mould, a destructive disease of tobacco plants which has been retarding the growth of the Australian tobacco industry, is likely to be conquered as a result of the research of Dr. H. R. Angell, J. M. Allan, and A. V. Hill of the Council for Scientific and Industrial Research, Canberra, Australia.

These scientists found that the infection of the tobacco plants was in the seedling stage and they adopted the practice of growing the seedlings in special beds which could be covered with glass and in which they placed a number of shallow vessels containing benzol or toluol, chemicals which are hostile to fungus growth. The young seedlings, therefore, grew in an atmosphere containing the vapor of one or other of these substances and though they remained strong and healthy themselves the fungus causing the disease got no opportunity to grow.

Once the young seedlings had survived the critical stage they could be transplanted with no fear of further infection. This method is now being tried out by the various Departments of Agriculture all over Australia and the results of large-scale field tests are being eagerly awaited by the scientists concerned and the tobacco growers who may be saved many thousands of pounds by this discovery.

Science News Letter, July 18, 1936

ANTHROPOLOGY

Ancestral Portraits

Scientist-Sculptors Have Developed an Improved Way To Carve Likenesses of Our Prehistoric Predecessors

By DR. FRANK THONE

PORTRAITS of ancestors interest all of us. Even in this new land of America, where pioneers and immigrants moved about so much that family connections were lost track of and family heirlooms mostly scattered to oblivion, we keep that perfectly natural, all-pervading human trait. We look eagerly enough at old family daguerreotypes and miniatures that some new-acquainted distant cousin shows us, and join him quite willingly in figuring out just what branch of the old family tree we are privileged to sit on.

And why not? Being interested in our ancestors is only an indirect way of being interested in ourselves. And everyone of us is interested in himself, unless there's something abnormal about him. Egotism is not a vice unless it is indulged in excess; in its normal development it is just an ordinary part of common human nature. There's nothing more snobbish about looking at a portrait of your great-great-grandfather than there is about sizing yourself up in the next mirror you pass.

This interest in ancestors extends even to forerunners who were not actual forebears. If you move into an old house that has a couple of portraits of its original builders, you are very likely to leave them in place. You may crack minor jokes about having "bought the ancestors along with the place"; but really you have a vague sense that they really belong—that there is some kind of a connection or continuity between them and yourself, though the tie be not one of blood.

Other Cultures Interesting

So even with a whole country. We are interested in Indians, here in America, and we are becoming increasingly interested in the Spanish, French, and other non-British cultures that once held and helped to develop parts of our land. Studies of their history, and of their influences on our own customs and culture of today, are becoming increasingly popular.

And if we are thus developing such a keen interest in our national and racial past, here where the past is partly so short and the rest so shadowy, what must the interest be in a country where the record of high civilization goes back almost to the beginning of the Christian era? And where the records of earlier dwellers in the land are both much more abundant and much more complex than they are here?

With our own arousing interest in the beginnings of America as background, we can understand better the effort that is being made now in Austria, to build a complete, scientifically accurate record of all the peoples that have ever lived on its ancient soil.

And there is a certain amount of direct personal interest in this enterprise, even for us. For we are most of us transplanted Europeans, and though Austria may be only a minor nation now, she was once the greatest of powers, and dominated Europe when much of our own early history was in the making. And the races that came and went, along the great double highway of the Danube and Rhine valleys, through scores of centuries, have played their parts on other parts of the European stage. So that archancestral portraits of ancestors and previous tenants in Vienna have a meaning for us, too.

New Technique

The effort of the Anthropological Department of the Vienna Museum of Natural History to establish a full series of family portrait-sculptures of ancient Austrians has resulted in a new technique in this difficult branch of scientific art. A school of what might be called palae-anthropological art, that works in a new way and achieves a different type of results, which many believe to be better and more accurate than anything hitherto done along similar lines.

The enterprise is under the general supervision of Dr. V. Lebzelter, Director, but the immediate charge of the science-sculptural work has been entrusted to a young woman (and a very comely young woman at that), Miss Rose Koller.

To her and her associate sculptors the scientists bring prehistoric skulls,

HOW IT IS DONE

The Vienna method of reconstruction. The thickness of the soft parts, as statistically ascertained from similar races, is indicated by plasticine buttons.

pieced together where they were broken, and with missing chunks of bone eked out with plaster. These skulls they compare critically with skulls of peoples existing in the world today, to find what modern racial types they most resemble.

Once this has been determined, the unique part of the new Vienna Museum technique is brought into play. The scientists and sculptors turn to measurements made on living possessors of these modern counterparts of ancient skulls. At dozens of critical points, on scalp and brow and nose and cheek and chin, they find how thick is the overlying complex of muscle and skin and fat and connective tissue. At each corresponding point, on an accurate model of the skull they are working with, the sculptor plants a pellet of plasticine, of exactly the measured thickness. The skull is finally dotted with them, until it looks as though it had been a target of pranking schoolboys.

These carefully measured bits of modeling material, planted at strategic points on the skull model, serve much the same purpose as the stakes that engineers drive with such accurate care on the site of a new building or along the course of a new road. They establish levels up to which the finished structure

is to be built. The sculptor fills in plaster or wax just as the contractor fills in brick or concrete. Then come careful smoothing-off, the addition of hair, eye-markings, etc., and great-great-great-ever-so-great-grandfather has a face!

Sounds easy. And it is—but only if you are a good sculptor, with a trained scientist at your elbow. That's the only catch.

Upsetting

Some of the results achieved in the Vienna Museum have rather upset previously existing notions of what certain races of prehistoric human beings looked like. It may startle some people, for example, to learn that the Alps were once inhabited by a race of decidedly negroid characteristics. Yet a skull of a woman of the Swiss Lake Dwellers, a race of the Late Stone Age, was so much like skulls of modern African Bushmen that the sculptors were perforce impelled to give their model a Bushman countenance.

These Lake Dwellers, for all they had heads like Bushmen, were anything but degraded and ignorant savages. They cut and trimmed trees, drove the trunks into the lake beds for piling, built their houses on platforms on these piles, made good canoes, knew how to weave and make pottery, and probably practiced agriculture. Not so bad, for Stone Age citizens!

NEANDERTAL WOMAN

The Vienna restoration somehow puts a touch of pathos into her low-browed physiognomy.

A Harder Problem

When confronted with a skull of the Crô-Magnon type, found in Austria but resembling skulls found in the art-decorated caves in France and Spain, the problem was a little more difficult. It used to be thought that the Crô-Magnon type of skull had passed completely out of existence thousands of years ago. But a small relict group of a tall, taciturn people on the Canary Islands were found to have skulls very much like the ancient Crô-Magnards. So measurements of the Canary Island people's face-thicknesses went into the restoration of the Crô-Magnon-type mammoth-hunter that was under construction in the laboratory-studios of the Vienna Museum.

Neandertal Man was a stumper. He really *is* extinct. Neandertaloid skulls are not found today among living men; even suggestions of their type are regarded as pathological. So the face-makers in the Vienna Museum were thrown upon their own resources.

They were guided, however, by at least some general principles. Their "preliminary-pellet" method had shown them that you cannot put on a skull a face that does not belong there. A gorilla skull, for example, will simply not accept a human face, and vice versa. So they did their best with rather remote analogies. It had also been observed that certain existing races have low foreheads, yet normal intelligence and wholly "human" faces. Therefore a "generalized" human face on a Neandertal skull worked out astonishingly well.

Pathetic Neandertaler

In fact, the physiognomy of a Neandertal woman—whether deliberately or unintentionally on the artist's part—actually arouses a sense of pathos, such as one may feel on seeing the worn face of a poor peasant woman, borne down with over-much toil. In any case, whatever may be the justification for putting that much feeling into the face of a Neandertaler, the Vienna sculptors have shown convincingly that this low-browed lost race does not need to be made to look like semi-apes.

Of course, the expression on any of these restored faces is largely a matter of the artist's choice. A Neandertaler might have scowled at you ferociously for thirty seconds, and then smiled, in his heavy-jawed way, all the rest of the day. So apart from the accuracies their measured-pellet method compel, the artists can, and to some extent probably do, put their own emotions into the faces they are making. Like the Deity in Genesis, they "make man after their own image."

(This argument should not be carried too far, however—certainly not into Futurist and Surrealist circles!)

Perhaps, then, the artist was feeling stern when he finished modeling the head of a Bronze Age conqueror who came into Europe through Spain in the 18th century B.C. Or it may be merely that he had a notion that a conqueror ought to look like that.

VIKING

Leif the Lucky, pre-discoverer of America, may have looked like this. The Norwegian government sent a Viking skull to the Vienna Museum, and the sculptors there built this face and head around it.

Stern Viking

The same might be the case with the restoration of a Viking face, built upon a Viking skull of ancient date sent by the Norwegian Government to the Vienna Museum. Certainly the end result has the expression of resolute, bleak-eyed hardness we have come to associate with the character of these famous sea-rovers.

The validity of the Vienna Museum method has received a couple of somewhat dramatic tests. Given the skull of a noted criminal whom she had never

seen in life, Miss Koller built upon it a quite recognizable likeness of the face that had once been there.

The other test was the more convincing, in that it had even the artists stumped for a time. An ancient Mongolian skull had been brought out of inner Asia, and a sculptor got to work on it. But try as he would, it wouldn't "come out right." The eyes persisted in being too deep-set. Disgusted, the sculptor decided that this job, at least, must be a failure. Then, one day while he was leafing through a collection of racial-type photographs, he jumped as though something had bitten him.

Staring at him out of one of the photographs, in the face of the Chinese general Tai Yen Kai, were a pair of just such deep-set Mongolian eyes!

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SEISMOLOGY

Earthquake is Recorded Near the Philippines

A SUBMARINE earthquake occurred south of the Philippine Islands on Sunday, July 5, at 1:54.7 p.m., eastern standard time. Instrumental data, gathered by Science Service and interpreted by the U. S. Coast and Geodetic Survey, indicate that the epicenter was at about 2 degrees north latitude, 123 degrees east longitude. This is in the Celebes sea, between the Philippines and the island of Celebes. The shock is reported as a strong one.

Observatories reporting were: the Manila Observatory, Manila, P. I.; the stations of the U. S. Coast and Geodetic Survey at Honolulu, T.H., and Tucson, Ariz.; Georgetown University, Washington, D. C., Fordham University, New York City.

Science News Letter, July 18, 1936

Recent prospecting in Portugal has revealed the location of some of the old Roman gold mines that have been mysteriously lost for centuries.

RADIO

July 21, 2:15 p.m., E.S.T.

SOMETHING NEW IN COTTON—R. W. Webb, Senior Cotton Technologist, U. S. Bureau of Agricultural Economics.

July 28, 2:15 p.m., E.S.T.

GROWING UP—Dr. Paul H. Furfey, Psychologist of the Catholic University of America.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

VITAL STATISTICS

Danger of Being Struck by Lightning is Very Slight

THERE is little chance of being killed by lightning in the United States, for only three persons in every million of the population have been struck down annually by electricity from the sky in the last 10 years.

New figures compiled by the Metropolitan Life Insurance Company statisticians show that despite the low general mortality, there are areas, including New Mexico, Arizona, Georgia and Mississippi, where each year about ten persons in a million lose their lives from this cause.

Frequency of thunderstorms is an important factor, but outdoor workers are in much greater danger than city dwellers.

In a city like New York, with many tall buildings built on solidly connected steel skeletons, almost complete protection from death by lightning is afforded not only to the persons within them, but also to those in their vicinity. These tall buildings act as most efficient lightning conductors, partly by dissipating the electric tension without any actual lightning discharge, and partly by receiving the lightning discharge when it does occur, and passing it harmlessly to the ground. It is a matter of relatively common occurrence in thunderstorms for these tall buildings to be struck without the slightest damage to the buildings or their occupants.

High Rate Belt

There is a continuous band of States, including Montana, Wyoming, Colorado, New Mexico, and Arizona, running from north to south, characterized by annual death rates of six per million and over; another continuous patch of States with these high rates is found in the southeast corner of the United States, including South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Arkansas. States bordering on these areas also had in most cases higher than average death rates from this cause.

In contrast, the Pacific Coast States and the highly industrialized States of New England and the Middle Atlantic Division ranked as the least hazardous parts of the country as regards fatalities from lightning. Outstanding among the States with low rates may be mentioned California, with a population of approximately six million, where there have been only five deaths from lightning in a ten-year period studied, and the State of Washington with a population of approximately a million and a half and only eight deaths in the same period.

In the death registration area of the nation during the period 1924-1933 there were recorded 3,849 lightning deaths, the equivalent of 385 per year.

Science News Letter, July 18, 1936

NUTRITION

Infants Thrive Better on Sodium Citrate Formula

NEW-BORN babies get a better start in life when they are fed a special sugar solution and sodium citrate during their first few days, Dr. Howard L. Eder of the Santa Barbara Clinic has found.

The sugar solution, a combination of maltose and dextrin, is already widely used as a supplement to cow's milk in infant feeding. Combining sodium citrate with the sugar solution is the new departure.

In a report to baby specialists, (*Archives of Pediatrics,* June), Dr. Eder states that this solution lessens the weight loss following birth and prevents the acidosis, fever and jaundice which "have been a grave source of concern to the medical profession for many years." Babies given the citrate-sugar mixture regain their birth weight more rapidly, nurse more vigorously and are in generally better condition.

The solution may be used in small institutions or the private home by simply dissolving six level tablespoons of the mixture of sugars and citrate in one quart of boiled water. This solution is given to the new-born infant starting six hours after birth. Two ounces are given every two or three hours for the first five days of life.

With the new treatment the average weight loss of 100 newborn babies was 4.2 ounces, and two-thirds of them had gained this back within the first eight days of life. During the past four years 800 babies have been given this solution and none has developed jaundice or fever.

Science News Letter, July 18, 1936

GENERAL SCIENCE

Nature's Editor Urges Science in Social Problems

Scientific Studies in Realm of Social Biology Declared More Important Than Physical Science Work

WHEN an entomologist looks at an ant-hill and writes learnedly and interestingly about what happens in that insect community, that, admittedly, is science. But when social workings of a nation or the world are viewed with a critical, scientific mind, the cry is likely to arise:

"That's not science."

Physicists, chemists and biologists have been reluctant to admit economics, political theory and practice, history and sociology into the category of "science." But an increasing volume of scientific voices has warned that those who give new command of natural forces have an obligation to see that research is put to socially safe uses.

An eminent British man of science, Sir Richard Gregory, Bart., editor of *Nature,* is the latest to urge (*Nature,* June 13) that "it is the duty of men of science to assist in promoting more worthy uses of the new powers they are continually placing in the hands of the community." Otherwise the world seems likely to be reduced to "a place of dust and ashes."

"The impacts of science with society are now so numerous that scientific studies in the realm of social biology are even more necessary for civilized life than researches in the physical sciences," Sir Richard contends.

Ironical Comment

"It is an ironical comment upon modern civilization that the social reaction to the gifts of plenty made possible by the progress of scientific knowledge is not a corresponding increase of human welfare but distress and unemployment and the prostitution of scientific effort to purposes of destruction.

"In so far as science has brought about increased control over the forces of Nature, it accepts responsibility for these conditions. It insists, however, that such deplorable consequences are not essential, but are due to the neglect of the application of scientific methods to the solution of social problems.

"Our distributive and economic system remains on the basis of a pre-scientific age, wholly unadjusted to the needs of a changing world, and unable to bear the burdens placed upon it by the problem of new and almost incredible abundance.

"Science can provide the world with everything required for the maintenance of a growing population in a rising standard of comfort; but there are no accepted principles for the right use of the new powers, and international agreements are mainly adjustments of national interests conceived in confined political atmospheres and determined by expediency. While this spirit prevails, the prospect of finding a formula which will unite civilized peoples for the general well-being of humanity seems almost hopeless.

"A regenerative influence is required to save civilization from disaster, and the mission of science in the changing world of today should be to introduce it into the field of social biology, and thus enable us still to believe in the highest destiny of man."

Science News Letter, July 18, 1936

PHYSICS

Model Indicates Cosmic Ray Path About the Earth

See Front Cover

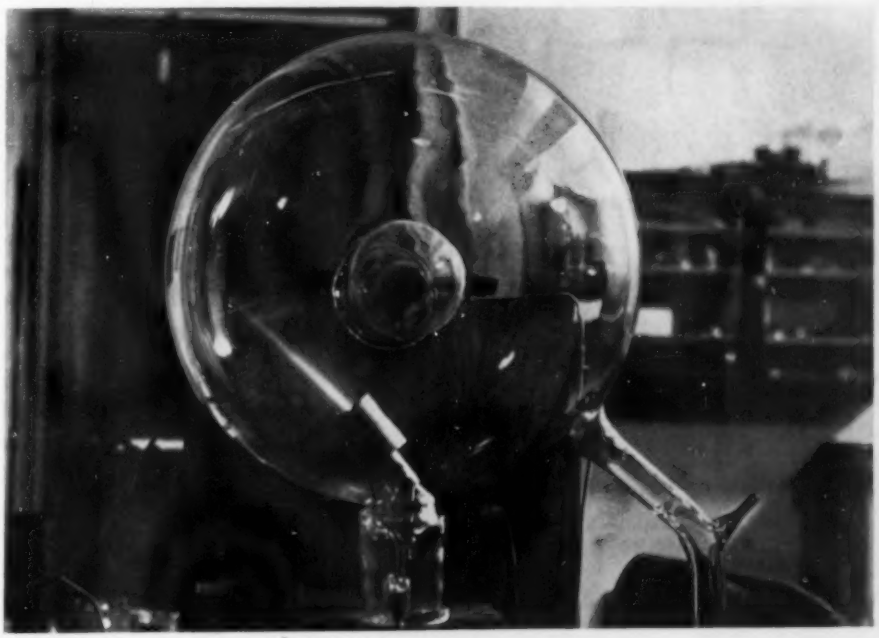
TO EXPLAIN the magnificent spectacle of the aurora borealis it was long ago suggested that our planet continually receives a bombardment of high speed electrically charged particles. At that time, however, no other evidence for such electrical showers existed.

When that subtle influence called cosmic radiation was discovered, and found to consist, in part anyway, of fast-flying electrical particles, this explanation of the aurora was verified.

For some of these charged particles (those of lower energy) are concentrated by the earth's magnetism around the magnetic poles. Breaking up atoms as they stream through the polar atmosphere, the luminescence known as the Northern Lights is produced.

Possibly originating in stars, this cosmic rain of electricity gives us a new contact with the material universe and may hold many secrets pertaining to stellar constitution.

The effect of the earth's magnetic



PATH OF COSMIC RAYS

Here is a daylight view of the model shown on the cover. They demonstrate strikingly the bending of cosmic rays by the magnetic field of the earth. The inner glass sphere represents the earth. The outer sphere is a vacuum bulb. The "cosmic rays" are streams of 100-volt electrons which can be deflected by the small magnet in the center.

field on the trajectories of high speed cosmic ray particles can easily be demonstrated in the physical laboratory. The pictures on the preceding page and on the cover show a device which was designed by Dr. W. F. G. Swann of the Bartol Research Foundation of the Franklin Institute.

A three-inch glass sphere containing an electromagnet represents the earth. Through the evacuated space around it is shot a beam of electrons. Unlike billion volt cosmic rays, however, these electrons are of only 100-volt speed and can readily be deflected by the small magnet.

Imagining, in the pictures, that the luminous beam represents positively charged cosmic ray particles, we are looking straight down upon the north pole of the earth. The cosmic ray path, in this case, lies in the plane of the equator.

In the picture on the cover, a ray of only moderately high energy is bent by the magnet. The view on the preceding page, taken with the magnet turned off, shows how an extremely energetic particle could pass undeviated through the earth's field.

This magnetic bending has provided physicists with information as to the energies of the rays, and has told them that the majority carry positive electrical charge. To this end, measurements in various parts of the earth—on mountain peaks and in stratosphere balloons—are interpreted with the aid of highly complicated mathematics.

Science News Letter, July 18, 1936

ENTOMOLOGY

Shocks Drive Out Borers From Infested Elm Trees

ELM BORERS infesting the trees of Victor H. Schmidt, of Kansas City, Mo., were dislodged in a manner literally quite shocking. Mr. Schmidt, weary of digging them out one by one with a pocket-knife, drove in a couple of nails a few inches apart, attached wires, and "turned on the juice" from a small magneto he had rigged up for his children to play with, and which they had previously been using to get angleworms out of the ground. Out came the borers in a very few seconds. Subsequent digging with the knife showed that the electric method had forced a hundred-per-cent evacuation of their dugouts.

In his report (*Science*, July 10), Mr. Schmidt suggests that perhaps a more powerful current might be used to advantage by nurserymen and orchardists.

Science News Letter, July 18, 1936

ECOLOGY

NATURE RAMBLINGS
by Frank Thone

Assisted Competition

BUFFALO grass, the short, crisp, curly growth that characterized the western prairies and plains when the white settlers first came, had no magical connection with the huge, shaggy beasts from which it derived its name. If anything, it was distinguished by being able to resist the trampling hoofs and devouring mouths of the buffalo more successfully than the bluestem and other tall grasses, and so came to dominate buffalo areas where it might otherwise have been crowded out.

This curious biological "triangle of forces," in which an animal harmed one group of plants and indirectly aided another, is discussed in a report by Dr. Frederic E. Clements of the Carnegie Institution of Washington.

The key to its discovery was a surviving area of buffalo grass, growing within sight of the tower of the Nebraska state capitol. Heavily grazed by cattle after the disappearance of the bison, it still preserved something of its old-time appearance. The thick short sod of the buffalo grass held almost all of the territory, with sparse scatterings of the tall prairie grass species here and there in it. The buffalo grass was decidedly "boss" of the situation.

Then a fence was thrown around part of the area, and all grazing stopped for a time. As if by magic, the tall grass species, now free to bear crops of seed, began to reassert themselves. They crowded out existing weed growths in a single season, and after a few years were dominating a great deal of the terrain previously almost monopolized by the buffalo grass.

This helps to explain a phenomenon noticed during the period of settlement, Dr. Clements said. The pioneers years ago noticed that wherever they went the buffalo grass vanished and the taller prairie grasses tended to take its place on the rangeland. They got the notion that buffalo grass and buffalo were somehow linked together, and that the tall grasses, traveling with the settlers, choked it out. What actually happened was that the settlers drove out or killed the bison herds, and the tall grasses, always present but kept down by bison grazing, were released from this repression to get the better of their shorter grass-competitor.

Science News Letter, July 18, 1936

METEOROLOGY

New Methods of Observing Allow Better Forecasting

MORE accurate and more continuous day-to-day observations of solar radiation will allow forecasting of some features of the weather two weeks in advance, Dr. C. G. Abbot, Secretary of the Smithsonian Institution, Washington, known for his studies on solar variations, told scientists at the A.A.A.S. meeting.

For the new method of weather forecasting an extension of the present solar radiation observations of the Smithsonian Institution will be needed. At present, there are three observatories on high mountain peaks in desert regions. Financial support has been provided for adding seven observatories to those now operating, so that the necessary weather forecasting information can now be obtained.

Another way of obtaining the information would be to use balloons that sail above 100,000 feet (about 20 miles) carrying with them extremely lightweight instruments that record the sun's radiation and flash their findings via short wave radio to scientists below on the earth.

Dr. Abbot's studies show that variations of solar radiation ranging from one-half to one and one-half per cent produce well-marked temperature changes of about 5 to 15 degrees Fahrenheit at various cities. And he finds that these changes occur in all months of the year, lasting at least two weeks after the solar causes die away. Dr. Abbot and other experts see in this a method of weather prediction which will look further into the future than the procedures now in daily use.

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Trees planted on the outside of highway curves are useful in warning motorists of a change in the direction of the road.

•First Glances at New Books

Additional Reviews On Page 48

Vital Statistics

LENGTH OF LIFE: A Study of the Life Tables—Louis I. Dublin and Alfred J. Lotka—*Ronald Press,* 400 p., $5. This comprehensive review of an important subject will be welcomed by specialists in many fields in which vital statistics are of importance. The lay reader with a liking for figures will find in the book much of general interest.

Science News Letter, July 18, 1936

Medicine

BEWILDERED PATIENT—Marian Staats Newcomer—*Hale, Cushman and Flint,* 323 p., $1.75. The doctor talks to the patient, explaining and counseling on a great variety of subjects ranging from diets and resistance to disease to selection of and cooperation with a physician and first aid in accidents. The book reads easily and probably will help clear up some bewilderment about medical matters. An index would have made it more useful for reference.

Science News Letter, July 18, 1936

Sociology

HUMAN MIGRATION — Donald R. Taft—*Ronald Press,* 500 p., $4. The emphasis in this textbook is not upon statistics or trends or a recounting of past and probable future movements of peoples, but upon the background of causes, the effects, and policies concerning control of human migration.

Science News Letter, July 18, 1936

Zoology

OUTLINES OF GENERAL ZOOLOGY (Third Edition)—Horatio H. Newman —*Macmillan,* 661 p., $3.50. A new edition of a well known and successful textbook.

A LABORATORY MANUAL FOR GENERAL ZOOLOGY—Katherine McClure Roehl and H. H. Newman—*Macmillan,* 99 p., $1.

Science News Letter, July 18, 1936

Psychology

KNOW YOUR MAN—Frank V. Martinek—*Christopher,* 30 p., $1. An emotional appeal to personnel managers to give greater consideration to those who come before them seeking employment.

Science News Letter, July 18, 1936

Sociology

PROSTITUTION IN THE MODERN WORLD—G. M. Hall—*Emerson Books,* 200 p., $2. This splendid presentation of an important and world-wide problem will find a ready welcome by social workers, health officers, physicians specializing in treatment of venereal diseases and others of similar interests. The socially minded layman will find it a reliable, unprejudiced source of information with which to prepare himself to meet the "challenge" the book presents.

Science News Letter, July 18, 1936

Nutrition—Economics

EAT, DRINK AND BE WARY—F. J. Schlink—*Covici, Friede Publ.,* 322 p., $2. The president of Consumers' Research paints a fascinatingly horrible picture of the dangers that may lurk in food and drink.

Science News Letter, July 18, 1936

Plant Pathology

CITRUS DISEASES AND THEIR CONTROL—Howard S. Fawcett—*McGraw-Hill,* 656 p., $6. The author has served on the faculties of both the University of Florida and the University of California, so that he is qualified by experience-on-the-spot as well as by technical training. Etiology, symptomatology, pathology, remedies, all come in for full and complete discussion. Nearly 200 excellent halftone figures, including a dozen or more full-page illustrations in color, aid materially in identification. There is a 42-page bibliography.

Science News Letter, July 18, 1936

Educational Psychology

HOW TO STUDY—A. M. Jordan—*Christopher,* 97 p., $1.25. Intended for those in high school, this volume should be useful to other students as well. An interesting feature is that the discussion of general principles and suggestions is followed by helpful hints for studying individual subjects.

Science News Letter, July 18, 1936

Medicine

DISEASE AND DESTINY—Ralph H. Major — *Appleton-Century,* 338 p., $3.50. From "the first great plague in history," the Black Death that devastated Athens in the fifth century before Christ, to modern times Dr. Major traces the influence of diseases on history and the people who made it. Vivid writing, and selection of a number of interesting and little-known incidents make this a highly entertaining as well as informative book.

Science News Letter, July 18, 1936

Biography

GREEN LAURELS—Donald Culross Peattie—*Simon and Schuster,* 368 p., $3.75. The lives and works of many naturalists, from Swammerdam and Buffon to Darwin and Fabre, and their work in field and laboratory, are here set down with the vigor and verve that comes only from a field man's first-hand understanding combined with the ability to tell a story well. Distinctly above average in illustrations and mechanical makeup, this book is excellent for gift purposes as well as for prideful possession on one's own shelves.

Science News Letter, July 18, 1936

Agriculture

STUDIES OF THE CULTURE AND CERTAIN VARIETIES OF THE JERUSALEM ARTICHOKE—Victor R. Boswell, C. E. Steinbauer, M. F. Babb, W. L. Burlison, W. H. Alderman, and H. A. Schoth—*Govt. Print. Off.,* 70 p., 10c. There has lately been a considerable revival of interest in the Jerusalem artichoke, as stock feed and as a possible commercial source for levulose and alcohol; and this makes this bulletin very timely.

Science News Letter, July 18, 1936

Medical History

TUBERCULOSIS—Gerald B. Webb—*Hoeber,* 205 p., $2. Tuberculosis is presented from the historical aspect in this pocket-size book. While it is of chief interest to medical men, it is not technical and lay readers with an interest in either history or tuberculosis will enjoy this volume.

Science News Letter, July 18, 1936

Medical Education

TRAINING OF THE NEUROLOGIST AND THE PSYCHIATRIST—Reprinted from the Archives of Neurology and Psychiatry, Vols. 29 and 30, 1933, and Vols. 31 and 32, 1934—*American Medical Association,* 102 p. Medical educators and young physicians or medical students intending to specialize in neurology or psychiatry will find this extremely valuable.

Science News Letter, July 18, 1936

Serology

THE SPECIFICITY OF SEROLOGICAL REACTIONS—Karl Landsteiner—*Charles C. Thomas,* 178 p., $4. For physicians and medical scientists; too technical for lay reading.

Science News Letter, July 18, 1936

•First Glances at New Books

Additional Reviews On Page 47

Exploration

THE CONQUEST OF YUCATAN—Frans Blom—*Houghton Mifflin,* 238 p., 31 pl., $3.50. An appreciative account of the Mayas by an archaeologist who has led numerous expeditions to unearth Mayan history. Dr. Blom combines Conquest history and archaeological evidence in his saga, which is designed to stir up the reader's interest in a remarkable people of America.

Science News Letter, July 18, 1936

Child Care

YOUR CHILD IN HEALTH AND IN SICKNESS—Hugh L. Dwyer—*Knopf,* 346 p., $2.75. Simply written, practical advice about the care and feeding of infants and small children which should be helpful to the mother in supplementing the specific advice obtained from her child's own physician.

Science News Letter, July 18, 1936

Mathematics

ESSENTIALS OF BUSINESS ARITHMETIC—Edward M. Kanzer and William L. Schaaf—*Heath,* 435 p., $1.28. A textbook for commercial classes in high schools, designed first to make good the deficiencies that handicap too many students and second, to give them special training in the kind of operations they will be called upon to perform when they have graduated and got jobs.

Science News Letter, July 18, 1936

Nursing

THE SCIENCE AND ART OF NURSING—Ella L. Rothweiler—*Davis,* 1196 p., 116 illus., $3. A comprehensive, detailed textbook of nursing which teaches the nurse how to care for her patient and counsels her on how to order her own life for greatest efficiency and happiness.

Science News Letter, July 18, 1936

Physiology

HUMAN PHYSIOLOGY (Seventh Edition)—Percy Goldthwait Stiles—*Saunders,* 446 p., $2.25.

Science News Letter, July 18, 1936

Agriculture

SOIL EROSION CONTROL—Austin E. Burges—*Turner E. Smith & Co.,* 187 p., $1.60. This book is small, but it has a lot in it about a subject that is absorbing more and more of the public's attention. It will be highly interesting to persons reading simply for information, and it will serve as a compact, practical handbook to farmers who want to keep Old Man Erosion from forcing a foreclosure on their land.

Science News Letter, July 18, 1936

Nutrition

FOOD, FITNESS AND FIGURE—Jacob Buckstein and Harlow Brooks—*Emerson,* 252 p., $2. A non-technical book with definite instructions for dieting either to reduce or to gain weight. It is to be hoped that the reader will follow the author's sound advice about consulting his physician before embarking on either of the dietary regimes. Tables of standard weights, of 100 calorie portions of common foods and charts of food values add to the practical value of the book.

Science News Letter, July 18, 1936

Medicine

THE NORMAL DIET AND HEALTHFUL LIVING—W. D. Sansum, R. A. Hare and Ruth Bowden—*Macmillan,* 243 p., $2. Sane and practical advice on a subject of universal interest is contained in this book which explains principles of nutrition at some length in non-technical terms. Housewives particularly will find the book helpful.

Science News Letter, July 18, 1936

Seismology

EARTHQUAKES IN NORTHERN CALIFORNIA AND THE REGISTRATION OF EARTHQUAKES AT BERKELEY—MOUNT HAMILTON—PALO ALTO—SAN FRANCISCO—FERNDALE, FROM APRIL 1, 1935 TO JUNE 30, 1935—James T. Wilson and Wilbert Annis—*University of California Press,* 38 p., 50c.

Science News Letter, July 18, 1936

Seismology

EARTHQUAKES IN NORTHERN CALIFORNIA AND THE REGISTRATION OF EARTHQUAKES AT BERKELEY—MOUNT HAMILTON—PALO ALTO—SAN FRANCISCO—FERNDALE, FROM JULY 1, 1935 TO SEPTEMBER 30, 1935—Perry Byerly and Wilbert Annis—*University of California Press,* 78 p., 50c.

Science News Letter, July 18, 1936

Biography

THE LIFE AND LETTERS OF JOHN GALSWORTHY—H. V. Marrot—*Scribner's,* 819 p., $5. Devotees of the modern style of fictionalized biographies may be disappointed in this volume, but Galsworthy lovers will be grateful to this biographer for letting them read an account of Galsworthy's life chiefly through his own writings, excerpts from Galsworthy's letters making up most of the bulky volume.

Science News Letter, July 18, 1936

Mental Hygiene

WOMEN AFTER FORTY—Grace Loucks Elliott—*Henry Holt,* 213 p., $1.25. Here is a book which should help women of forty and over to understand themselves and their problems and to work out a satisfactory solution of the latter.

Science News Letter, July 18, 1936

Genetics

HUMAN GENETICS AND ITS SOCIAL IMPORT—S. J. Holmes—*McGraw-Hill,* 414 p., $3.50. This book is rather technical, and the questions at the chapter ends suggest a textbook, but the lay reader with some knowledge of biology will find it interesting and may gain from careful reading of the book the necessary factual background on which to found intelligent opinions of topics much discussed at the present time.

Science News Letter, July 18, 1936

Mathematics

PRACTICAL MATHEMATICS—N. J. Lennes—*Macmillan,* 400 p., $1.20. A text in advanced arithmetic for high-school freshmen, in which everything is given in terms of problems met in everyday life: cost of auto upkeep, installment buying, insurance, elementary statistics, etc.

Science News Letter, July 18, 1936

Biology

METHODS OF TISSUE CULTURE IN VITRO AND OUTLINES OF HISTOLOGICAL METHODS—Ralph Buchsbaum and Clayton G. Loosli—*University of Chicago Press,* 81 p., $1.

Science News Letter, July 18, 1936

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